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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,713	07/25/2003	Randall Malterer	87324.1800	1897

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EXAMINER	
KERNS, KEVIN P	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 08/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/626,713	MALTERER, RANDALL	
	Examiner	Art Unit	
	Kevin P. Kerns	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-16,18,19,21,22 and 28-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-16,18,19,21,22 and 28-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 July 2003 and 01 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5, 7, and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "the third material". There is insufficient antecedent basis for this limitation in the claim. It is suggested to replace "the" with "a" to establish proper antecedent basis.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 9-14, 19, 22, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (paragraphs [0002]-[0007] of specification) in view of either Wang et al. (US 5,429,173) or Lee (US 5,642,853).

The applicant's admitted prior art discloses a chill block, a method for its assembly, and the use of the chill block in a tool device as an assembly, in which the

assembly includes a first surface of a chill block (base) made of steel coupled (bonded by grease and/or other connecting means) to a second surface of a chill block (base) made of copper, such that the chill block assembly includes first and second chilling means defining a chill block passageway therebetween, with the chill block assembly arranged within a tool device (mold defining molten metal inlet means and shaping means) that includes molten metal overflow means from the die/mold cavity (paragraphs [0002]-[0007] of specification). The applicant's admitted prior art does not specifically disclose the forming of the first surface or chill block in a ceramic mold, as well as the specific types of steel, copper, and surface hardness of the materials. However, one of ordinary skill in the art would have recognized that the use of a ceramic mold instead of a metal mold (both of which are refractory materials commonly used in casting processes), as well as use of any of the three types of steel and beryllium copper to obtain a surface hardness of 30 to 70 Rockwell "C" scale, would have been obvious substitutions of materials to a metal casting artisan, as these materials are functional equivalents (as well as conventional materials for use in casting processes), and a reasonable expectation of success would occur upon use of one or more of the combinations of these conventional, equivalent materials. The applicant's admitted prior art does not disclose the method of chemically bonding a second material to a first material surface.

However, Wang et al. disclose a method of metallurgical bonding of metals and/or ceramics, in which the method includes embodiments of diffusion (chemical) bonding between two metals, including iron/steel to copper metallurgical bonding, such

that the chemical bonding is advantageous for obtaining a tenacious bond at the interface between the metals via exothermic formation of intermetallic phases at the interface (abstract; column 1, lines 5-9 and 56-68; column 2, line 1 through column 8, line 43; and Figures 1-4).

In addition, Lee discloses a method of diffusion bonding steel to copper and copper alloys, in which the method includes chemical bonding between a copper layer 32 and a steel layer 34, such that the chemical diffusion bonding is advantageous for obtaining an interlayer material to yield a strong bond at elevated temperatures (abstract; column 1, lines 5-7 and 60-63; column 2, lines 1-20 and 37-67; column 3, lines 1-67; column 4, lines 1-28; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the chill block, the method for its assembly, and the use of the chill block in a tool device as an assembly, as disclosed/suggested by the applicant's admitted prior art, by using the methods of diffusion (chemical) bonding between two metals that include iron/steel and copper, as taught individually by Wang et al. and Lee, in order to obtain a tenacious bond at the interface between the metals via exothermic formation of intermetallic phases at the interface (Wang et al.; abstract; column 1, lines 56-64; column 2, lines 4-33; column 4, lines 21-26; column 5, lines 55-68; and column 6, lines 1-6) and to obtain an interlayer material to yield a strong bond at elevated temperatures (Lee; abstract; column 1, lines 60-63; column 2, lines 1-20; and column 4, lines 21-25).

5. Claims 5-8, 15, 16, 18, 21, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (paragraphs [0002]-[0007] of specification) in view of either Wang et al. (US 5,429,173) or Lee (US 5,642,853) as applied to claims 1 and 19 above, and further in view of Cheskis et al. (US 5,343,926).

The applicant's admitted prior art (in view of either Wang et al. or Lee) discloses and/or suggests the elements of claims 1 and 19 above. Neither the applicant's admitted prior art, Wang et al., nor Lee specifically discloses the rapid solidification spray casting process, the thickness of 0.5 inches for the first material/layer, bonding of a third material to a side of the second material, and machining steps.

However, Cheskis et al. disclose a metal spray forming process and apparatus that uses multiple nozzles having at least two metal spray regions, in which the thickness of the spray materials is controlled by the speed of the moving substrate and flow rate of the atomizing gas, such that the spray materials are preferably copper or copper alloys, with the first and second spray deposits (16,17) forming coatings of second and third materials onto the moving substrate (first metal material) with varying degrees of thickness, resulting in a nearly uniform metal composite material 20 having desired physical properties (minimum of porosity) obtained via spray casting (abstract; column 2, lines 63-68; column 3, lines 1-2, 11-47, and 59-66; column 4, line 11 through column 9, line 41; and Figures 1 and 2). Although not specifically disclosed by Cheskis et al., one of ordinary skill in the art would have recognized the need for at least a step of light machining (column 9, lines 35-38) of the edges of the substrate and/or the first

and second spray deposits, as scattered/uneven spray patterns would result in a non-uniform (varying thickness) cast composite product.

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the chill block, the method for its assembly, and the use of the chill block in a tool device as an assembly, as disclosed/suggested by the applicant's admitted prior art, by using the methods of diffusion (chemical) bonding between two metals that include iron/steel and copper, as taught individually by Wang et al. and Lee, in order to obtain a tenacious bond at the interface between the metals via exothermic formation of intermetallic phases at the interface (Wang et al.) and to obtain an interlayer material to yield a strong bond at elevated temperatures (Lee), and by further modifying the process of manufacture of the chill block by using a rapid solidification spray casting process, the thickness of 0.5 inches for the first material/layer, bonding of a third material to a side of the second material, and machining steps, as taught/suggested by Cheskis et al., in order to obtain a nearly uniform metal composite material having desired physical properties, including a minimum of porosity (Cheskis et al.; column 1, lines 10-13; column 2, lines 63-68; column 3, lines 1-2, 11-14, 33-35, and 59-66; and column 4, lines 11-15, 41-46, and 59-63).

Response to Arguments

6. The examiner acknowledges the applicant's amendment provided with the request for continued examination received by the USPTO on July 27, 2005. The

amendments overcome prior objections to the drawings and claims. However, amended claim 5 now includes a limitation that lacks antecedent basis (see paragraph 2). The applicant has cancelled claims 23-26, and overcomes prior rejections under 35 USC 102(b)/(a). The applicant has added new claims 28-30. Claims 1, 3, 5-16, 18, 19, 21, 22, and 28-30 are currently under consideration in the application.

7. Applicant's arguments with respect to claims 1, 3, 5-16, 18, 19, 21, 22, and 28-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Imabayashi et al. and Breit et al. references are also cited in PTO-892.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns Kevin Kerns 8/26/05
Primary Examiner
Art Unit 1725

KPK
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August 26, 2005